

Geel 2000 Language Schools

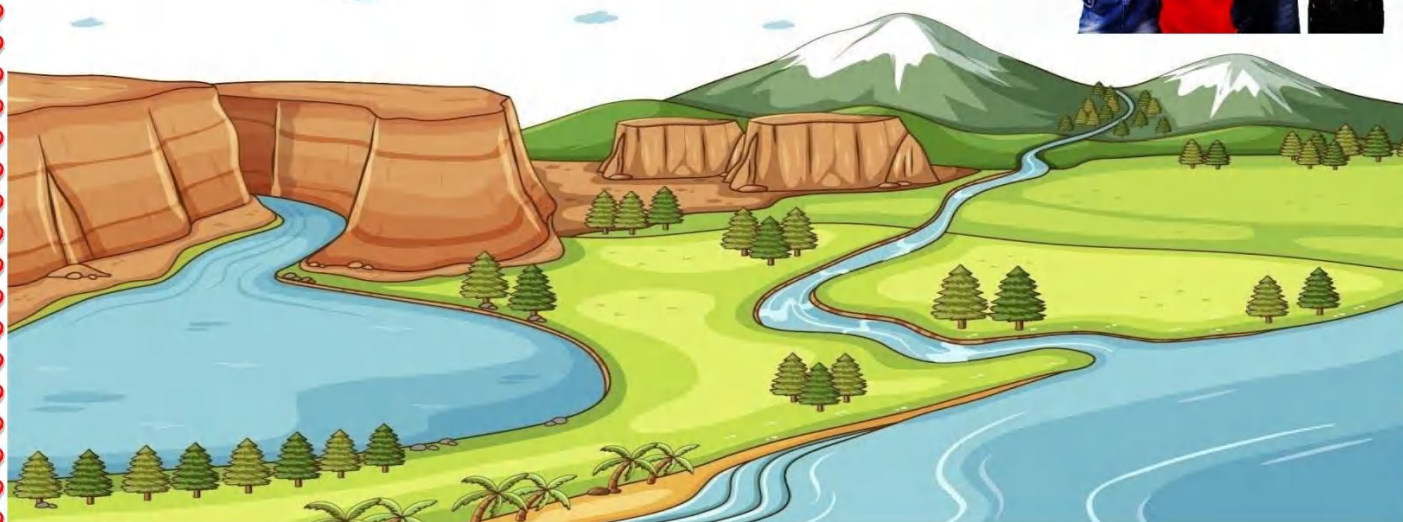
Science Department

Primary (5)

Concept (3.1),(3.2)

Second term

(2025/2026)



Name:.....

Class:.....

Concept (3.1)

Lesson (1 and 2)

Hydrosphere and Biosphere Interactions

- The Earth is a complex system that includes living organisms and nonliving things that interact with each other.
- Scientists divided the Earth into four main systems (spheres) which are:

✓ Geosphere (Land):

- It is the system that includes rocks on the Earth's crust.
- Molten rocks and heavy metals that lie under the Earth's crust.
- Such as rocks and soil

✓ Atmosphere (Air):

- It is the system that is composed of a mixture of some gases such as **nitrogen, oxygen, carbon dioxide, water vapor.**
- It is the wind (that moves the Leaves).
- It's Breathing of humans

✓ Biosphere (Life) :

- It is the system that includes all living organisms such as **microorganisms, plants (trees , grasses), Animals (birds , butter flies) , humans (boy and girl)**

✓ Hydrosphere (Water):

- It is the system that includes all water on the Earth such as fresh water and salt water like Puddle.

- Water is an important natural resource for all Living organisms. *(Give reason)*

Because:

- 1- Animals and plants need water to drink, grow and survive.
- 2- People use water for drinking, cooking, bathing and playing.
- 3-Some animals and plants live in water.

- Water is important for all living organisms and also can **affect non-living** things.

✓ **Water can affect nonliving things like rocks (Give reason) ?**

Because water can cause **weathering** and **erosion** of rocks.

Weathering	▪ It is a Process of breaking down rocks into smaller particles due to movement of water (rain) , wind and temperature .
Erosion	▪ Process in which the small particles of rocks are transported from a place to another by water or wind



✚ **Note :-**

- Water is found everywhere on Earth ,where it is found in (Rivers , lake , Oceans , seas and underground)
- Nearly three-quarters (more than 70%) of Earth is covered by water.

Give reason For: Earth looks like a blue marble from space?

Because water covers three –quarter of the Earth

- Water on Earth can change from liquid state to:

- Solid state (ice) by freezing in extreme cold weather.
- Gas state (water vapor) by Evaporation in hot weather.
- **The total amount of water on Earth does not change, even if water changes from one state to another, so we cannot make new water, but we can recycle it.**

- Humans use water in many purposes such as:

- | | |
|-------------------|---------------|
| 1. Bathing | 4. Cleaning |
| 2. Preparing food | 5. Travelling |
| 3. Manufacturing | 6. Recreation |

Water bodies on Earth have different forms and locations such as:

- Oceans and seas:

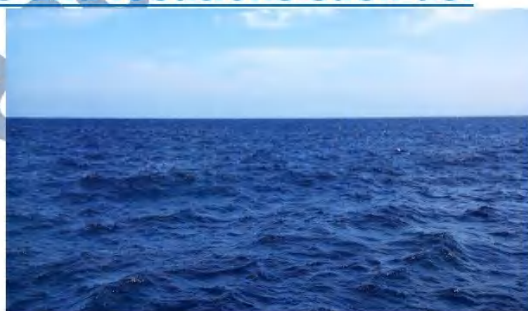
- They are very large water bodies.
- **Oceans and seas** always contain salt water.

- Lakes:

- A lake is a water body that is surrounded by land.
- Lakes are often contain fresh water, but sometimes they contain salt water.

- Rivers:

- A river is a water body that always flows from an area of high place to an area with lower place in a definite channel.
- **Rivers** always contain fresh water.



○ Groundwater:

-It is the water that lies beneath (under) the Earth's surface.



Renewable resource

Is a natural resource that can be replaced

➤ Is water a renewable resource?

Water that forms the hydrosphere is a renewable resource. because it has "water cycle" in nature.

❖ During the water cycle in nature:

- Water on the Earth evaporates and goes into the air forming clouds.
- Water returns back to the Earth's surface during raining.

➤ plants are a renewable resource? (Give reason)

Because

- 1- they can grow again through their life cycle.
- 2- They never run out.

✚ Notes :

- Plants can be planted from **seeds** that grow up forming new plants.
- Plants depend on water to grow and survive, so
- Plants are affected if the amount of water decreases or water gets polluted.
- Hydrosphere interacts with biosphere, where living organisms such as plants in the biosphere depend on the hydrosphere to survive.

Lesson (3)

Geosphere:

Geo

Means

Earth



It is the system that includes:

(rocks, minerals, soil).

- Landforms (such as mountains, valleys...)
- Molten rocks inside Earth.
- It is also known as (**Lithosphere**)

Hydrosphere:

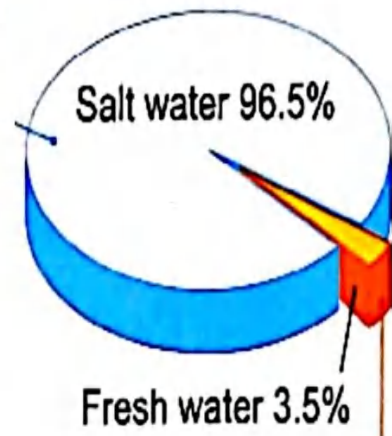
Hydro

Means

Water

- It is the system that includes all of the water on , under and above Earth.
- About 71% of Earth is covered by water.
- Water that covers Earth may be:

P.O.C	Salt water	Fresh water
Ratio	It forms about 96.5% of water On Earth	It forms about 3.5% of water On Earth
Found in	Ocean , seas , gulfs and some lakes	River , rainwater , ground water and most of lakes



- This system contains: (oceans -seas - rivers. - groundwater – glaciers).

Glacier	It is a large sheet of ice or snow that moves slowly over Earth's surface. -It is made of ice.
----------------	---



Ground water

- It is water that lies **beneath** (under) the Earth's surface
- It has been leaked into Earth through a layer of **porous rocks**

➤ Some characteristics of hydrosphere:

- Hydrosphere contains all the **liquid, solid** and **gaseous water** on Earth.

About 71 percent (71%) of Earth is covered by water.

✚ Notes:

- Most of the fresh water on Earth is **not found** in liquid or running water, but it is **found** in the form of **frozen** water as large pieces of ice known as **glaciers**.

Atmosphere:

Atmos

Means

Vapor

-It is the system that includes all the gases that surround Earth.

-The atmosphere is usually called **"air"**.

-Air (atmosphere) is a **mixture of many gases** such as:

(oxygen gas - carbon dioxide gas - nitrogen gas).

Biosphere:

Bio

Means

Life

-It is the system that includes all living organisms on Earth.

-Biosphere contains: (**humans – animals - plants**).

➤ Some characteristics of biosphere:

- Biosphere is any part of Earth in which life can exist.
- **Biome**: It is a large region of the world that has **similar** soil, climate, plants and animals (wildlife).
- Examples of biomes:
 - Deserts.
 - Rainforests.
 - Wetland.
 - Forests.
 - Grassland.



Earth's systems interact:

The interaction between the different four systems of Earth:

Interactions	Phenomena
Hydrosphere interacts with geosphere.	*Erosion of rocks by water. * Formation of lakes.
Atmosphere interacts with biosphere.	• During photosynthesis process, plants take in carbon dioxide gas from air and give out oxygen gas to air. • Respiration process .
Geosphere interacts with biosphere.	• During photosynthesis process, soil provides nutrients for plants roots.
Hydrosphere interacts with biosphere.	• Plants need water to survive. • Humans and animals drink water to survive. • Water is habitat of fish

Lesson (4)

Water ecosystems are also called **aquatic ecosystems**.

Aquatic ecosystems on Earth can be classified in different ways such as, they can be classified into:

1- Saltwater ecosystems.

2- Freshwater ecosystems.

★ Saltwater ecosystems:

- Oceans are the **largest** saltwater ecosystems that cover large parts of Earth's surface.
- Saltwater ecosystems of oceans and seas include: **Shallow** and **deep** areas .

Shallow areas	Deep
• Contain coral reefs and intertidal zones ➤ Intertidal zones : Is the area along the coast that disappears under water at the high tide and appears at the low tide. 	• These areas are called abyssal zones ➤ Abyssal zones : Are very deep areas in oceans so that sunlight cannot reach them

Saltwater lakes:

-Some lakes have salt water.

-Ex. 1-Lake Assal in Djibouti. / 2-Lake Bardawil in Egypt

- **Lake Assal** has a high concentration of **natural** salts, so it is too salty for fish and most aquatic animals to live in also, there are few plants that can grow in this area.

Lake Assal:



-There are many different types of **bacteria** live in Lake Assal.

Freshwater ecosystems:

Freshwater ecosystems include: 1-Ponds and lakes.

2-Flowing water bodies .

-In many ponds and lakes, the water is present all year.

➤ **Some ponds and lakes may dry up during some months? (G.R)**

Because when the temperature increases in summer, water evaporates faster. so animals and plants that live there must adapt to the changes that happen in these ponds and lakes.

✚ Notes :

- **Lake Nasser** is freshwater lakes **in Egypt**.

Flowing water bodies:

- They include rivers and streams

Streams	Are small bodies of flowing water
----------------	-----------------------------------

- Water is always moving in the flowing water bodies.

- Many different plants and animals live in flowing water bodies.

Lesson (5)

Aquatic Ecosystems:

Living organisms that live in three different aquatic systems which are (ponds, streams and Oceans)

P.O.C	Ponds	Streams	Oceans and seas
Type of water	Fresh water	Fresh water	Salt water
Water movement	Still water	Running water where water in streams are cool and flows fast.	Constantly moving in the form of waves that crash onto the shore.
Species live in	- Some plants like (Water lilies) - Some types of worms - Salamanders and Frog 	- Cat fish - Trout (salmon) 	- Kelp - Dolphin - Starfish - Moses fish (Flounder fish)

Notes:

- Oceans and seas environments include many smaller ecosystems.
- Ocean water circulates around the world in patterns called ocean currents.

Concept (3.2) (Water as a Valuable Natural resource)

Lesson {1}

Can you explain?



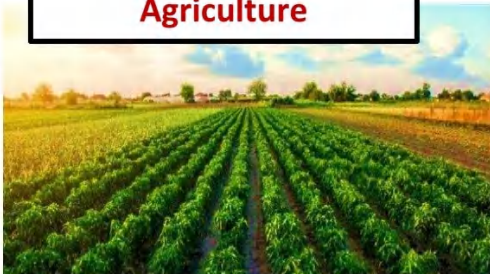
- Water is a valuable natural resource on Earth?
 - All living organisms (humans, animals and plants) need water to survive.
 - Water makes up nearly two-thirds of the human body.
 - Water keeps the body temperature of living organisms moderate.
- ✓ Give reason for: We must conserve fresh water ?
Because there is a limited amount of water on Earth.
 - Most of the water is salt water which cannot be processed by most plants and animals.

The importance of water

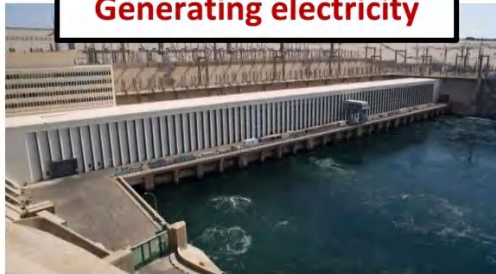
Uses of water

- Drinking, bathing, cleaning vegetables and fruits, fishing and transportation.
- Some other uses of water such as:

Agriculture



Generating electricity



Sources of water on Earth such as:

- | | | | | |
|---------|----------|--------|-------------------------|-----------|
| .Rivers | .Streams | .Lakes | .Oceans | .Glaciers |
| .Seas | .Ponds | .Rains | .Groundwater (Aquifers) | |

Sources of fresh water and sources of water:

{1} Sources of fresh water:

Groundwater



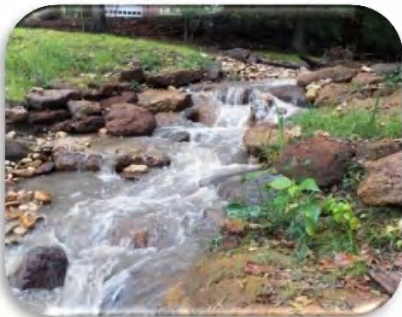
Rains



Glaciers



Streams



Ponds



Rivers



{2} Sources of salt water

Sea



Ocean



Note :

the percentage of fresh water that is suitable for drinking is very small compared to the percentage of water on earth .

-Most of lakes contain fresh water and some contain salt water.

Conserving fresh water:

• Conserve the limited amount of fresh water through many ways such as:

- {1} Turning off water tap (faucet) during brushing your teeth.
- {2} Taking a quick shower.
- {3} Turning off the water while washing your hair.

Details some water bodies:

[1] A river:

- **Type of water:** fresh water.
- **Location:** Mountains
- A river often starts in the mountains as a stream
- The flow of a river ends when it meets a sea or a larger river



[2] A lake

- **Type of water:** most of lakes contain fresh water.
- **Location:** Low-lying areas.
- A lake is a large body of water surrounded by land.
- A lake forms when water collects in a low-lying area.



[3] A wetland

- **Type of water:** Fresh water .
- **Location:** Land partially covered with water.
- **From kinds of wetlands:** Swamps (marshes) and ponds (bogs).



[4] An estuary

- **Type of water:** Salt water mixes with fresh water.
- **Location:** Where a river meets a sea or an ocean.
- Estuaries are home to thousands of plants and animals.



[5] Groundwater

- **Type of water:** Fresh water.
- **Location:** In the cracks and spaces of underground rocks.
- There is more amount of groundwater on Earth than the water in rivers and lakes.



[6] Oceans

- **Type of water:** Salt water.
- **Location:** Oceans surround the continents.
- All of the oceans are connected to each other.
- The ocean's floor has mountains, plains and plateaus.



• Lesson {2} Water of Earth

Earth's Fresh Water

- Fresh water is needed for drinking, irrigation, agriculture, industry, generating electricity, Etc.
- More than 10% of the world's animal species live only in freshwater habitats.
- Fresh water scarcity and quality are two main risks that are threaten the World.
- **Poor quality of fresh water leads to:**
 - The death of thousands of living organisms every year.
 - The extinction of some species live in fresh water such as some fish and amphibians

➤ Humans use some strategies to control and conserve fresh water for their needs such as :

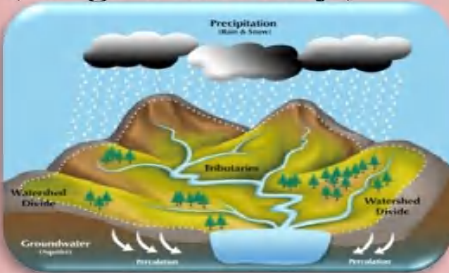
1-Building dams across rivers to store water

These Human activities cause imbalance of water that leads to :

Drought

Flooding

Watershed (Large water body)



It is an area of land where water from different sources flows towards a common location usually an ocean, a sea or other large water body.

⚡ Notes :-

▪ Freshwater systems focuses on the balance of water in watershed, where:

- 1- When there is more rainfall, the level of water in rivers or streams will increase causing floods.
- 2 - When there is too little rainfall, the level of water in rivers or streams will decrease, so these water bodies may dry up causing drought.
- 3- But when there is water balance, rivers or streams will have a constant source of fresh water.

Lesson {3} Watershed predictions

A **watershed** help scientists understand how the water bodies in an area interact with one another.

Human activities that take place in some water bodies as tributaries and affect people, plants and animals that live near or in these tributaries.



Tributaries	They are small water bodies such as small creeks or streams that flow into bigger rivers.
-------------	---

Tributaries as small creeks or streams

flow
into

Bigger rivers

flow
into

Larger water bodies
as bays, seas and
Oceans

What happens upstream in a watershed affects the water bodies downstream

***Upstream:** is place where a river starts.

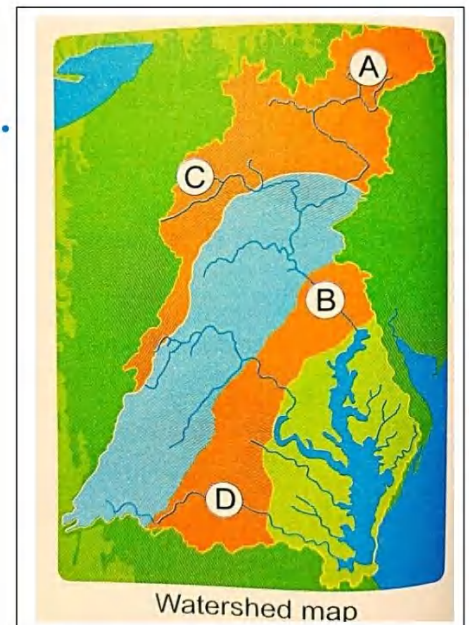
***Downstream :** is place where a river ends

① If a factory is built near a tributary at the area A.

-The factory waste will affect the tributary at Area (A)

-Water in tributary at area (A) carries the factory Waste to other water bodies connected to it

Causing water pollution .



② If a dam is built across a tributary at area B.

-The dam will hold the water behind it and this causes a change in the amount of water in other water bodies connected to this tributary.

③ If there is a farm using chemical fertilizers near a tributary at area C, the farm waste will affect the tributary at area C.

- The water in tributary at area C carries the farm waste that leak to other water bodies connected to it causing water pollution.

④ If a trash dump is established near a tributary at area D.

-The litter of a trash dump will be blown into the water of tributary at area D

-On windy days, the water in tributary at area D carries the litter into other water bodies connected to it causing water pollution.

Dam	It is a building established across a river which can hold water behind it .
------------	--

✓ Farms near tributaries may cause water pollution ? (Give reason)

Due to using of chemical fertilizers that cause water pollution .

Lesson (4)

There are many things are made from natural resources such as:

- **Paper** is made from **trees**.



- **Plastic** is made from **oil products**.



- **Clothes** are made from **plant** like **cotton** and **animal products** such as **wool** of sheep.



Ways to conserve natural resources:

Preservation	Sustainability
- It is the (action) restricting access (control reaching) of humans to these natural resources or using them. <u>Preservation of natural resources</u> Means prevent using or developing natural resources in special areas .	- It is an important way of resources conservation - using resources in a way that doesn't negatively affect the future supply of these resources .
Examples : Countries prevent using or developing of natural resources in some protected areas of land such as: 1-Ras Mohammed protectorate in South Sinai . 	Example: Cows feeding (grazing) on grass in a field where grass grows slowly 
2-Wadi Al-Hitan in Fayoum. 	➤ <u>Sustainable situation:</u> If cows placed in one large area of grass so, cows still have more food and grass grow back in other areas. ➤ <u>Unsustainable situation:</u> If cows are placed in many small areas of grass they began eating all grass before new grass could grow in these areas, so grass disappeared and cows will be hungry.

Results of overusing (depletion) some natural resources :

Natural resources	Results when using them more quickly
Fish	Because of overfishing they become rare and fishing will decrease.
Groundwater	It will run out and wells will become dry.

❖ Factors affecting resource sustainability:

- 1- Overpopulation.
- 2- Pollution.
- 3- Unequal distribution of resources.
- 4- Overuse (over consumption) or damage of resources.

Natural resources may be:

- 1- **Renewable** such as: water, plant and animals.
- 2- **Non - renewable** such as : oil and coal.

✚ Note:

- Renewable resources can be **used up** if people don't use them wisely.

➤ Examples :

- 1- When fresh water polluted .it becomes undrinkable.



2- Pollution of coal leads to soil pollution that causes death of plants and animals.



3- Cutting down trees leads to deforestation causing soil erosion.



❖ Uses of water:

- It is important for human to survive, taking shower ,washing hands , brushing teeth, watering plants, cooking food and flushing a toilet.

Note:

We must conserve water during our daily activities by changing our habits like:

- 1- Decrease the time of some activities like taking shower.
- 2- Turn off water during some activities like brushing teeth.



❖ To calculate the average amount of water that a person use in some daily life activities .

First method :

Activity requires water	Number of minutes to do this activity each time	Multiply	Amount of water used each minute	Equal	Total amount of water used to do this activity each time
Taking a shower	10 minutes	x	7 liters	=	70 liters
Brushing teeth with water running	4 minutes	x	6 liters	=	24 liters

Second method :

Activity requires water	Number of times you repeat this activity in one day	Multiply	Amount of water used to do this activity each time	Equal	Total amount of water used to do this activity in one day
Flushing a toilet	4	x	5 liters	=	20 liters
Washing hands	6	x	4 liters	=	24 liters

If there is more than one person (for example: family)

Activity requires water	Total amount of water used to do this activity in one day (from previous table)	Multiply	Number of family members	Equal	Total amount of water for the family to do this activity in one day
Flushing a toilet	20 liters	x	4	=	80 liters
Washing hands	24 liters	x	4	=	96 liters

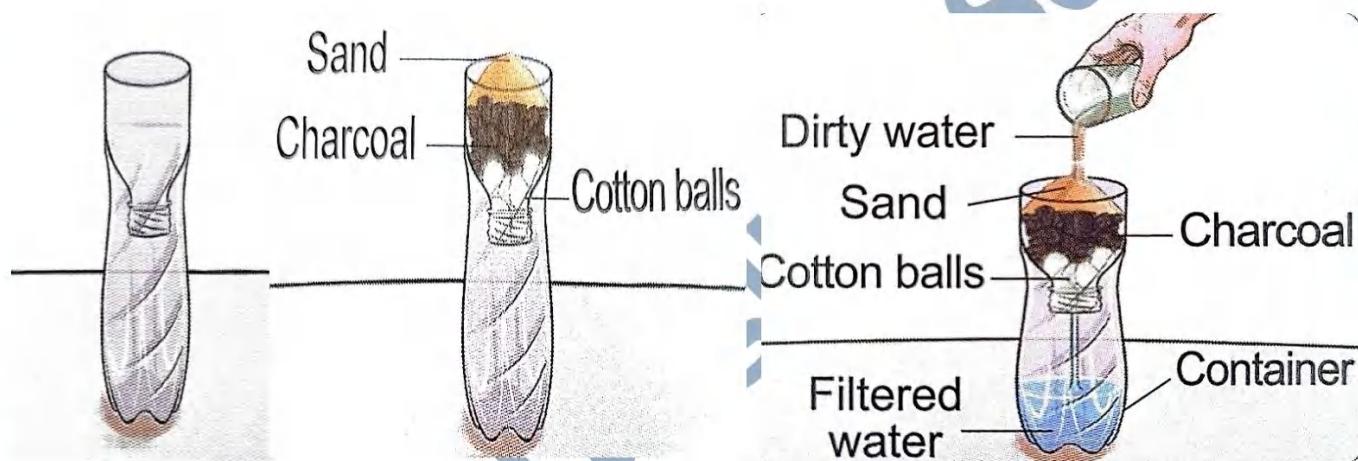
Lesson (5)

Human creates many methods to filter water to recycle wastewater or polluted water to use it again.

Recycle waste water	Removing harmful materials from water
---------------------	---------------------------------------

Let's make a water filter (activity in the class)

You can make dirty water by adding mud to clear water.



➤ Observations :

- 1-The filter removes most of dirt from dirty water .
- 2-The filtered water moves down at the bottom of the container .

➤ Conclusion :

Water filters : are used to remove harmful materials from polluted water to get filtered water that human can use in many purposes .

⚙ Note :-

- Cotton , sand and charcoal can be used in making a simple water filter .

Lesson (6)

- We can conserve water by **Recycling water**.

- **Solar energy**:

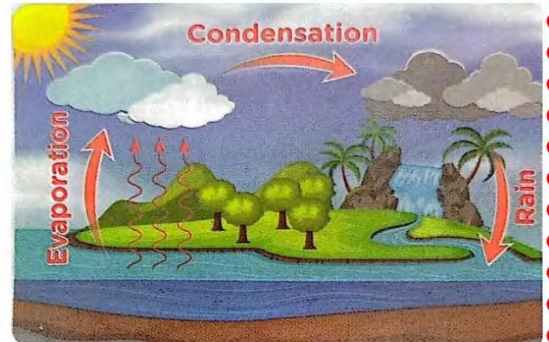
is very important in **recycling water** .

- **Water cycle** : is considered as an example of **recycling water**.

- **Wastewater**: water that has already been used in homes and different industries .

- **Wastewater engineers**:

They are special kinds of scientists and some of them **work in water** treatment plants which remove harmful materials from water.



Bahr Al –Baqar wastewater treatment plant in Egypt.

Water treatment plants	They are stations which recycle wastewater by removing harmful materials from wastewater to reuse it .
-------------------------------	--

Role of wastewater engineers

- 1- They design tools that provide us with clean water.
- 2- They observe the water quality and check the amount of pollutants in water.
- 3- They decide where to build water treatment plant.
- 4- They observe and check each step in water treatment process.
- 5- They design ways to protect a community from floods.
- 6- They calculate the amount of drinking water that we need.
- 7- They test the sources of drinking water in communities to make sure it is safe to drink.



موقع الدكتور محمد رزق التعليمي



امسح الباركود بالموبيل لتثبيت
التطبيق وتحميل كل الملازم مجاناً وبسرعة



حمل التطبيق الآن



كورسات ونتائج امتحانات



ملازم ثانوي



ملازم اعدادي



ملازم ابتدائي



موقع الدكتور محمد رزق
Dr. Mo. RIZK



D.M.RAZK

موقع الدكتور محمد رزق معلم الكيمياء التعليمي